

CLAIMS

Claim 1. An apparatus for explosively severing a length of pipe having an internal flowbore, said apparatus comprising: a tubular exterior housing having an interior barrel extending between opposite distal ends of the barrel; a plurality of high explosive pellets in axial alignment and bound together as a singular and independent unit that may be selectively inserted within said barrel and withdrawn unexploded therefrom as a single unit; and, electrically initiated detonation means engaging the explosive pellet unit.

Claim 2. An apparatus as described by claim 1 wherein said detonation means comprises detonators at opposite ends of said pellet unit.

Claim 3. An apparatus as described by claim 1 wherein the detonators respective to said opposite ends are connected for simultaneous detonation.

Claim 4. An apparatus as described by claim 3 wherein said opposite end detonators resiliently bear compressively against respective ends of said pellet unit.

Claim 5. An apparatus as described by claim 3 wherein one end of said exterior housing is selectively detached, with one of said detonators, from the remainder of said exterior housing for loading said pellet unit into said barrel.

Claim 6. An apparatus for explosively severing a length of pipe having an internal flowbore, said apparatus comprising:

- (a) a tubular housing having an internal barrel space between opposite distal ends for aligning an axial column of explosive material;
- (b) detonator socket housings disposed at opposite ends of said opposite distal ends;
- (c) resilient bias means for resiliently translating at least one socket housing along said barrel space toward the other socket housing;
- (d) exploding bridge wire detonators in said socket housings; and,
- (e) a capacitive firing device electrically connected to said exploding bridge wire detonators.

Claim 7. An apparatus as described by claim 6 wherein at least one of said detonator housings may be selectively separated from said tubular housings while maintaining an electrically conductive connection with said firing device.

Claim 8. An apparatus as described by claim 6 wherein one distal end of said tubular housing is sealed by a closure means that is selectively removed from said tubular housing to load a column of explosive material into said internal barrel, said closure means including the socket housing respective to said one distal end.

Claim 9. An apparatus as described by claim 8 wherein said closure means further including a guide aperture for aligning said explosive material within said internal barrel.

Claim 10. An apparatus as described by claim 6 wherein the socket housing respective to said other distal end is resiliently biased along the length of said internal barrel to compressively confine said column of explosive material between said socket housings.

Claim 11. A method of severing a length of pipe having an internal flow bore comprising the steps of:

assembling a plurality of high explosive pellets into a singular, columned unit;
depositing said columned unit into a tubular barrel;
resiliently engaging at least one end of said columned unit with detonator means;
positioning said tubular barrel within said flow bore at a predetermined location along the length of said flow bore; and,
electrically initiating said detonator means.

Claim 12. A method of severing a length of pipe as described by claim 11 wherein detonator means engage opposite ends of said columned unit of high explosive pellets.

Claim 13. A method of severing a length of pipe as described by claim 12 wherein opposite end detonator means are simultaneously initiated.

Claim 14. A method of severing a length of pipe as described by claim 11 wherein said plurality of high explosive pellets are unitized in a column separate from said tubular barrel and inserted in said tubular barrel as a singular unit prior to positioning said barrel within said flow bore.

Claim 15. A method of severing a length of pipe as described by claim 14 wherein said plurality of pellets are formed for meshed engagement with unitizing structure whereby said unitizing structure and meshed pellets are inserted within or removed from said tubular barrel as a singular unit.

Claim 16. A method of severing a length of pipe having an internal flow bore comprising the steps of:

- providing a tubular barrel space for assembling a column of highly explosive material;

- providing exploding wire detonators at opposite ends of said tubular barrel space;

- providing a capacitive firing device for selectively igniting said detonators substantially simultaneously;

- assembling a column of highly explosive material within said tubular barrel space;

- resiliently engaging opposite ends of said explosive material column with said exploding bridge wire detonators;

- positioning said tubular barrel within the internal flow bore of a pipe at a predetermined location along the length of said flow bore; and,

- electrically initiating said detonator means.

Claim 17. A method as described by claim 16 wherein said column of explosive material is assembled externally of said tubular barrel and positioned into said barrel space as an integral unit;

Claim 18. A method of severing a string of pipe extending within a well bore from a wellhead site, said method comprising the steps of:

providing a severing tool at a wellhead site, said severing tool having an internal barrel space between opposite distal ends within a substantially tubular housing;

providing exploding bridge wire detonators at said opposite distal ends;

electrically connecting said exploding bridge wire detonators to a capacitive firing device for substantially simultaneous ignition of said detonators by said firing device;

delivering said electrically connected severing tool to a wellhead site;

depositing a column of explosive material in said internal barrel space between said exploding bridge wire detonators at said wellhead site;

positioning said severing tool at a predetermined location within a string of pipe suspended from said wellhead site; and,

detonating said column of explosive material by an electrical signal to said capacitive firing device.

Claim 19. A method as described by claim 18 wherein said column of explosive material is assembled as a singular unit externally of said barrel space and deposited in said barrel space as a singular unit.

Claim 20. A method as described by claim 19 wherein said column of explosive material is deposited within said barrel space without electrically disconnecting either of said detonators.